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Mr. Sin-Kie Tjho
Project Manager
United States Environmental Protection Agency, Region 2
290 Broadway, 22nd Floor
New York, New York 10007

Re: Justification for No Further Action
Solid Waste Management Unit 26
Former Chevron Perth Amboy Facility
Perth Amboy, New Jersey
SRP PI # 003621

Dear Mr. Tjho:

INTRODUCTION

Solid Waste Management Unit (SWMU) 26 is located in the East Yard of the former Chevron Perth Amboy Facility, located at 1200 State Street, Perth Amboy, New Jersey (Facility). SWMU 26 was identified as one of the areas requiring corrective measures (CMs) in the Corrective Measures Study (CMS) Final Report (Chevron 2008a). The United States Environmental Protection Agency (USEPA) issued a Resource Conservation and Recovery Act (RCRA) Hazardous and Solid Waste Amendments (HSWA) Permit Renewal (Permit) for the Facility on September 3, 2013 (USEPA 2013). The Permit identified the following CMs for SWMU 26:

1. Excavation, ex-situ stabilization (ESS), and disposal in the Corrective Action Management Unit (CAMU) for Total Organic Lead (TOL) concentrations greater than 2 milligrams per kilogram (mg/kg) in soil
2. Filing of a deed notice for benzo(a)pyrene (BaP) concentrations less than 10 mg/kg and greater than 0.66 mg/kg
3. Containment consisting of a cap with filing a deed notice afterwards for arsenic concentrations > 20 mg/kg in surface soil
4. In-situ geochemical stabilization for arsenic groundwater concentrations > 60 micrograms per liter (µg/L) using direct injection and/or reactive barrier wall
5. Monitored natural attenuation and filing a Classification Exception Area for groundwater

A Pre-Design Investigation (PDI) was developed to define the extent of the tetra-ethyl lead (TEL) impacted area that would require ESS CM and to close remaining data gaps within SWMU 26 (Parsons 2014). The purpose of this letter is to present a summary of the investigations that have been conducted at SWMU 26 and to provide justification that no further action (NFA) is required at SWMU 26 for TEL in soil.

SUMMARY OF HISTORICAL INVESTIGATIONS

Historical TEL Results

The SWMU 26 boundary is based on the potential presence of an approximately 75-foot by 75-foot TEL weathering area as shown on the Refinery Leaded Burial Map (Chevron 2008a). Five soil borings were advanced within SWMU 26 between 1998 and 2003 as part of the RCRA Facility Investigation. Since the findings and conclusions of these investigations were previously reported to USEPA in the 2003 RCRA Facility Investigation (RFI) Report (Chevron 2003), they are only summarized here. Figure 1 (attached) is an aerial photograph on which the SWMU 26 historical boring locations and analytical results are presented. The boring locations at which concentrations above the CMI action levels were identified are noted in red, and the TEL concentrations above the CMI action levels are highlighted in yellow. Of the samples collected from the five borings, only one (S0848 at a depth interval of 15 to 15.5 feet below ground surface [bgs]) exceeded the CMI action level for TOL (see Table 1). Four results from samples collected from the remaining borings were nondetect for TEL, but the method detection limit (MDL) was above the CMI action level of 2 mg/kg. The vertical extent of impacted soil identified in S0848 was defined by the result (0.44 mg/kg) from a shallow soil sample collected at a depth interval of 11.5 to 12.0 feet bgs within S0848. In 2006 as part of the Supplemental RFI (Chevron 2008b), boring S2323 was advanced adjacent to S0848 for vertical delineation and to confirm TOL was not present in the peat layer. A sample collected at a depth interval of 18 to 18.5 feet bgs was nondetect (0.17 U mg/kg) for TEL.

Table 1
SWMU 26 Historical Sample Results for TEL/TOL above CMI Action Level [1]

Boring ID	Sample Date	Sample Depth (feet bgs)	TEL/TOL (mg/kg)
S0378	08/10/1998	10 – 10.5	14U [2]
S0379	08/10/1998	12.5 – 13	13U [2]
S0380	08/11/1998	9 – 9.5	17U [2]
S0381	08/11/1998	11.5 – 12	15U [2]
S0848	08/20/2002	15 – 15.5	13.1[3]

U = compound was not detected at the method reporting value noted

1. Detected and nondetect results with reporting values above the CMI action level (2 mg/kg) are included
2. Results reported as TEL but represent the TOL concentration (see following discussion)
3. Result reported as TOL and represents TOL (see following discussion)

The samples listed in Table 1 were typically collected in intervals where black staining and hydrocarbon odors were observed. These intervals were also associated with elevated photoionization detector (PID) readings.

Historical Results for Other Constituents

Historical results for lead, BaP, and arsenic are also presented on Figure 1. As shown, all lead results in SWMU 26 were below the CMI action level (800 mg/kg).

Historical soil results for BaP were nondetect or below the CMI action level except for one detection (2 mg/kg) at S0848 at a depth of 1.5 to 2.0 feet bgs. While this result is above the New Jersey Department of Environmental Protection (NJDEP) Non Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) for BaP (0.66 mg/kg), it is well below the CMI action level (10 mg/kg). In addition, two nondetect results have MDLs above the NRDCSCC. Specifically, these results were 1 U mg/kg at S0379 at a depth of 12.5 to 13.0 feet bgs and 2.5 U mg/kg at S0381 at a depth of 11.5 to 12.0 feet bgs.

Arsenic was identified above the CMI action level (20 mg/kg) in only one sample. A sample from S0848 at a depth interval of 1.5-2.0 ft bgs contained 50.7 mg/kg of arsenic.

Monitoring wells MW-144, MW-253 (located in the suspected TEL burial) and MW-175 (downgradient of the suspected TEL burial) were installed in SWMU 26 between 2002 and 2006. Groundwater samples collected from these monitoring wells did not contain lead at concentrations greater than 50 µg/L.

TEL versus TOL analysis

Soil samples collected during the 1998 and 2003 RFI were analyzed using the California Leaking Underground Fuel Tank (LUFT) method. The California LUFT method reports the total concentration of the following five alkyl-lead compounds:

- Tetra-methyl lead
- Trimethyl-ethyl lead
- Dimethyl-ethyl lead
- Methyl-triethyl lead
- TEL

The California LUFT method does not differentiate between the five alkyl-lead compounds, and the results represent TOL concentrations in soil. The 1998 data were however reported as TEL, while the soil data collected during the 2003 RFI were more appropriately reported as TOL.

Soil samples collected in 2006 and during the PDI were analyzed for TEL following USEPA SW-846 Method 8270C, which does differentiate between the separate alkyl-lead compounds. Results for the 2006 investigation and PDI samples are reported as TEL in soil. A conservative approach was used to evaluate and compare historical and PDI results. All results were assumed to be TEL regardless of how the results were reported.

PDI METHODOLOGY

The 2008 CMS Report identified SWMU 26 as requiring ESS for the removal of TEL/TOL-impacted soil that exceeded the CMI action level of 2 mg/kg. As presented in Table 1, above,

only one historical result exceeded the CMI action level. The objectives of the PDI were to confirm the historical result and evaluate any TEL/TOL impacts horizontally or vertically.

PDI soil borings were located in the field using a 30-foot by 30-foot sampling grid. Soil borings were advanced at grid nodes or as close to the grid nodes as practical given subsurface conditions and the results of pre-clearance activities. Soil samples were collected from depth intervals where impacted soil was historically observed (generally ranging from 10 to 15.5 feet bgs). PDI soil samples were also collected based on field screening results (i.e., high PID readings, staining, and odors). Soil cores were screened using a PID in 6-inch intervals. Samples were collected where the PID readings exceeded 100 parts per million (ppm). If PID readings in excess of 100 ppm were observed over a 2-foot interval, a sample was collected from the 6-inch interval exhibiting the highest PID reading.

Soil borings were logged for visual appearance, olfactory observations, and field PID readings. Characteristics such as color, grain size, plasticity and moisture content were recorded. A Unified Soil Classification System code was assigned to each soil type based on field observations. PDI and historical boring logs are included in Attachment 1.

In order to vertically delineate any observed potentially impacted soil, additional samples were collected from presumed non-impacted intervals above and below the potentially impacted soil based on field screening results. The additional samples were analyzed if the analytical results from the potentially impacted sample exceeded the CMI action level for TEL (2 mg/kg).

Soil samples were collected using single-use, disposable scoops and transferred directly into laboratory provided jars. All soil samples were stored on ice in a laboratory-provided cooler and transported to Eurofins Lancaster Laboratories Environmental, LLC, Lancaster, Pennsylvania, for analysis using USEPA SW-846 Method 8270C. A summary of historical and PDI analytical results is included in Attachment 2.

Upon sampling completion, soil borings were backfilled with soil cuttings or with bentonite chips, as appropriate. The surface was restored to previous site conditions and marked for surveying. All PDI borings were surveyed for elevation (in the National Geodetic Vertical Datum 29) and surface location.

PDI RESULTS

A PDI was performed at SWMU 26 in October and November 2014 and in March 2015. Twenty-two soil borings were advanced using a track-mounted, direct-push technology Geoprobe® rig. The PDI analytical results are presented in Table 2 (attached). Soil boring locations and PDI sample results are presented on Figure 2.

Evaluation of Historical Boring S0378

Historical boring S0378 is located in the central portion of SWMU 26 to the north of boring S0848. As shown on Table 1 above, a historical nondetect TEL result (14U mg/kg) was identified at a depth of 10 to 10.5 feet bgs. The MDL was above the CMI action level.

Soil boring S4683 was advanced adjacent to historical boring S0378 to confirm the potential presence of TEL at this location. The result of a soil sample collected at a depth of 10.0 to 10.5 feet bgs was nondetect (0.037 U mg/kg) for TEL.

PDI soil borings S4545, S4550, and S4570 were advanced to the west, north, and east, respectively, of historical boring S0378 to evaluate the potential presence of TEL in soil surrounding boring S0378. Soil samples were collected from each boring at a depth of 10.0 to 10.5 feet bgs. Soil samples were also collected from shallower intervals based on field screening results (i.e., high PID readings, petroleum odors, and staining) and from the 6-inch interval immediately overlying the organic peat. With the exception of one nondetect result (4.9 U mg/kg) for S4545 at a depth of 13.5 to 14.0 feet bgs, all other nine results were nondetect and below the CMI action level (2 mg/kg). It is noted that the results for samples collected one foot above and below this sample location (S4545 at a depth of 13.5 to 14.0 feet bgs) were nondetect, with an MDL below 2 mg/kg.

Soil borings S4588 and S4589 were advanced to the west and north, respectively, of PDI boring S4545. Soil samples were collected from 13.5 to 14.0 feet bgs corresponding to the interval at S4545 and from intervals one foot above and below this interval. TEL levels were below detection except for one nondetect result (3 U mg/kg), with a MDL slightly above the CMI action level. This sample was collected from S4589 at a depth of 13.5 to 14 feet bgs. The samples above and below this interval were nondetect, with MDLs below 2 mg/kg.

Evaluation of Historical Boring S0379

Historical soil boring S0379 is located in the southern portion of SWMU 26 and to the east of historical boring S0848. As shown on Table 1 above, an historical nondetect TEL result (13 U mg/kg) was identified in a sample collected at a depth of 12.5 to 13 feet bgs. The MDL was above the CMI action level.

Boring S4684 was advanced adjacent to historical boring S0379 to confirm the potential presence of TEL in soil at this location. One soil sample was collected from a depth of 12.5 to 13.0 feet bgs from an interval described as a black stained sand. A second soil sample was collected from a black stained peat layer at a depth of 13.0 to 13.5 feet bgs. Results for both samples were nondetect for TEL (0.044 U and 0.53 U mg/kg), with MDLs below 2 mg/kg.

PDI soil borings S4549 and S4573 were advanced to the south and east, respectively, of historical boring S0379. Soil samples were collected from each boring at a depth of 12.5 to 13.0 feet bgs corresponding to the depth of the historical sample collected from S0379. Soil samples were also collected from shallower intervals based on field screening results (i.e., high PID readings, petroleum odors, and staining) and from the 6-inch interval immediately overlying the organic peat. With one exception, results for all samples were nondetect for TEL, with MDLs below the CMI action level. The exception was one sample result at S4549 at a depth of 13.5 to 14.0 feet bgs. The result (2.9 U mg/kg) at this location was nondetect, but the MDL was slightly in excess of the CMI action level.

Additional sampling was conducted to further evaluate any potential TEL impacts. Soil borings S4547, S4548, and S4587 were advanced to the west, east, and south, respectively, of PDI boring S4549. Soil samples were collected at multiple depth intervals from a black stained organic mud layer overlying a brown peat layer. Although the sample depths vary slightly from boring S4549, the descriptions of the samples are consistent, indicating that the samples were collected from the same stratigraphic interval. Laboratory analytical results were nondetect for TEL, with MDLs below the CMI action level, with the exception of one sample at S4587 at a depth interval 12.5 to 13.0 feet bgs. While this nondetect result (7.5 U mg/kg) had an MDL above the CMI action level, samples above and below this interval were nondetect, with MDLs below 2 mg/kg.

Evaluation of Historical Boring S0380

Historical soil boring S0380 is located in the northern portion of SWMU 26. As shown in Table 1 above, a nondetect TEL result (17 U mg/kg) for a sample collected at a depth interval of 9.0 to 9.5 feet bgs had an MDL above the CMI action level. As part of the PDI, soil boring S4562 was advanced adjacent to historical boring S0380 to evaluate the potential presence of TEL in soil at this location. One soil sample was collected from a depth of 9.0 to 9.5 feet bgs from an interval described as a black stained clay/organic (mud) silt. A second soil sample was collected from a black stained clay/organic (mud) silt layer immediately overlying a peat layer at a depth of 12.0 to 12.5 feet bgs. The PDI sampling results for TEL were nondetect, with MDLs below 2 mg/kg.

PDI soil borings S4544, S4569, S4575, and S4579 were advanced to the east, south, northwest, and north, respectively, of historical boring S0380. Soil samples were collected from each boring at a depth of 9.0 to 9.5 feet bgs, which corresponds to the depth of the historical sample collected from S0380. Soil samples were also collected from PDI borings S4569, S4575, and S4544 from the 6-inch interval immediately overlying the organic peat. Results for all samples were nondetect for TEL, with MDLs below the CMI action level.

Evaluation of Historical Boring S0381

Historical soil boring S0381 is located in the central portion of SWMU 26. As shown in Table 1 above, a nondetect TEL result (15 U mg/kg) for a sample collected at a depth interval of 11.5 to 12.0 feet bgs had an MDL above the CMI action level.

As part of the PDI, soil borings S4563, S4571 and S4572 were advanced to the north, southeast, and southwest, respectively, of historical boring S0381 to evaluate the potential presence of TEL in soil in this area. Soil samples were collected from a depth of 11.5 to 12.0 feet bgs at each boring location. TEL results for all samples collected in these borings were below detection, with MDLs below the CMI action level.

Evaluation of Historical Boring S0848

Historical soil boring S0848 is located in the southeastern portion of SWMU 26, and a soil sample collected at a depth of 15.0 to 15.5 feet bgs contained 13.1 mg/kg TEL. Soil boring S4682 was advanced adjacent to historical boring S0848, and three soil samples were collected

for analysis. One soil sample was collected from a black sand and lightly stained black peat layer at a depth of 14.0 to 14.5 feet bgs. The other two soil samples were collected from an olive green peat layer at a depth of 15.0 to 15.5 feet bgs and from 16.0 to 16.5 feet bgs. Results for all samples were nondetect, with MDLs below the CMI action level (2 mg/kg).

Soil borings S4546 and S4547 were advanced to the west and south, respectively, of historical boring S0848. Soil samples were collected from a depth of 15.0 to 15.5 feet bgs. Soil samples were also collected from shallower intervals based on field screening results (i.e., high PID readings, petroleum odors, and staining). TEL analytical results for all samples were nondetect, with MDLs below the CMI action level.

CONCLUSIONS

The sampling results from the PDI as described above address the data gaps remaining from historical investigations. A total of 22 borings were advanced, and 49 soil samples were collected for TEL analysis. The results for all samples analyzed for TEL were nondetect. Within these nondetect results, only four had MDLs above the CMI action level. At each of these four locations, samples were collected directly above and below the interval with the elevated MDL result and all results were nondetect, with MDLs below 2 mg/kg.

At S0848, the only historical detection above the CMI action level could not be confirmed because all results from subsequent investigations were nondetect, with MDLs below the CMI action level. Although the CMS recommended ESS to address the historical TOL exceedance in SWMU 26, the extensive PDI results demonstrate that TEL is not present in soil at concentrations above the CMI action level. Therefore, no further action for TEL in SWMU 26 soil is warranted.

Isolated concentrations for BaP and other constituents identified above the NJDEP Residential Direct Contact Soil Cleanup Criteria will be addressed in the Facility-wide Deed Restriction. The one historical detection for arsenic above the CMI action level will be addressed as part of the evaluation for capping of arsenic in surface soil as required in the HSWA Permit. Groundwater samples will continue to be evaluated on a Facility-wide basis.

Based on the soil results, Chevron requests review and approval by USEPA of this NFA request for TEL in SWMU 26 soil.

REFERENCES

Chevron. 2003. Full RCRA Facility Investigation Report. November.

Chevron. 2008b. Supplemental RFI Report, Chevron Perth Amboy Facility, NJ. February.

Chevron. 2008a. Corrective Measures Study Final Report for the Main Yard, East Yard, and Central Yard Chevron Perth Amboy Refinery, Perth Amboy, New Jersey. November.

Parsons. 2014. Pre-Design Investigation Work Plan SWMU 26. June.

USEPA. 2013. Letter to Chevron USA, Inc. and Buckeye Perth Amboy Terminal LLC Notice of Issuance of Final Permit Renewal and Permit Modification I Decision, Chevron USA, Inc. and Buckeye Perth Amboy terminal LLC, EPA ID No: NJD081982902. July 19.

ATTACHMENTS

Table 2 – Summary of PDI Analytical Results (note Table 1 is embedded)

Figure 1 – SWMU 26 – Historical Sampling Results
Figure 2 – SWMU 26 – PDI Results and Pertinent Historical Data

Attachment 1 – Historical and PDI Boring Logs
Attachment 2 –Summary of Analytical Results

Should you require any additional information for your review, please do not hesitate to contact me directly at (732) 738-2023.

Sincerely,

Robert Mancini
Project Manager
Refining Business Unit

cc: Ms. Anne Pavelka, NJDEP
D-ID Number 2016-044-37

bcc: Mr. Bob Lavorerio
Mr. Eric Kovich, Buckeye Perth Amboy Terminal
Mr. Ken Siet, TRC